



Snowpack in the Olympic mountains continues to decline.

FOREWORD

Global Warming is a Fact.

Greenhouse gases heat the planet and continued warming of our climate is virtually locked into the global system far into the future.

Among thousands of scientists who study this problem, there is no disagreement on these facts. There is disagreement, however, about the specifics: how much warming will occur, where, in what time frame, and with what impacts?

How will the Puget Sound region specifically change in response to this planetary heating? That complex question is the subject of this report.

At the global level, society has never faced a problem such as this. Starting some 420,000 years ago all the way up to 150 years ago, the ambient concentration of CO₂ in the atmosphere varied between 180 to 280 parts per million by volume (ppmv) as the earth lurched between glacial and interglacial conditions. Today the concentration is about 380 ppmv and climbing.

The scientific community is reasonably certain the planet has not experienced such high concentrations of carbon dioxide (CO₂) for at least 420,000 years, and most probably not for 20 million years.

From paleoclimatological evidence, we know that over the history of the earth high levels of greenhouse gas concentrations have correlated with, and to a large extent caused, significant warming to occur, with impacts generated on a global scale.

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“It is up to all of us to ensure that we take the actions needed to prepare.”

Given the residence times of greenhouse gases in the atmosphere (several decades) and the long time it takes for the ocean to fully communicate with the atmosphere (several centuries), even if we stopped emitting CO₂ today, warming would continue for many decades.

From a policy standpoint, this disconnect between sometimes costly actions now and benefits that could be realized far in the future has prevented meaningful action, but continued delays to act guarantee that problems posed by climate change will be worse.

As we hone our knowledge of global climate change, understanding the consequences on the local level becomes more crucial so that we may prepare and adapt. Getting to answers about local impacts requires experts to zoom in and do place-based analyses and projections at the regional and sub-regional scales. This report will help us get to the needed policy discussions about how we can adapt to the coming changes.

The Puget Sound Action Team's 2004 *State of the Sound* report shows many of the indicators of the Sound's health trending down. The human footprint is exhibited in many ways: changes in land-use/urbanization, increases in pollutants entering the Sound via river runoff and reaching estuaries and the coastal ocean, excess nutrient loading; coastal erosion and excessive armoring; and overfishing.

This footprint will be difficult to reduce given the large population growth projected for the region over the next two decades.

Climate change heightens many of the challenges facing Puget Sound. There are two major drivers of the future environmental

quality in this region: the specific effects of global warming combined with the size and scale of the human footprint. This report describes probable effects of climate change, and lays out scenarios of what climate change will mean for the Puget Sound region.

The ecosystems of Puget Sound are now caught in a world of multiple stresses where the pressures of human population growth and economic development will mix with the consequences of a warmer world. This new world presents significant environmental and management challenges.

One of our most immediate needs is to develop the institutional capacity to manage both the rates and magnitudes of change on the horizon. It is the job of the scientist to provide objective information.

It is up to all of us to ensure that we take the actions needed to prepare.



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